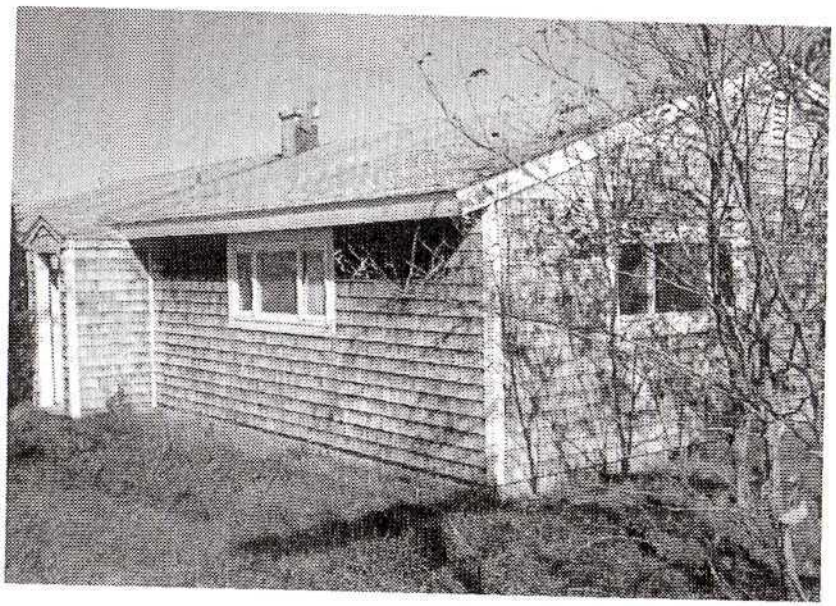
Building Number: 217

Original Name: **Family Housing with Garage**

Est. Year of Construction: **1959**

General Data

- Square Footage: 1,815
- # of Floors: 1
- # of Rooms: 7
- # of Bedrooms: 3
- # of Bathrooms: 1
- # of Kitchens: 1
- # of Laundry Rooms: 1 (utility room)
- # of Shower Rooms: 0
- Basement or Crawl Space? Slab-on-grade
- Ceiling Heights: 7'-6"

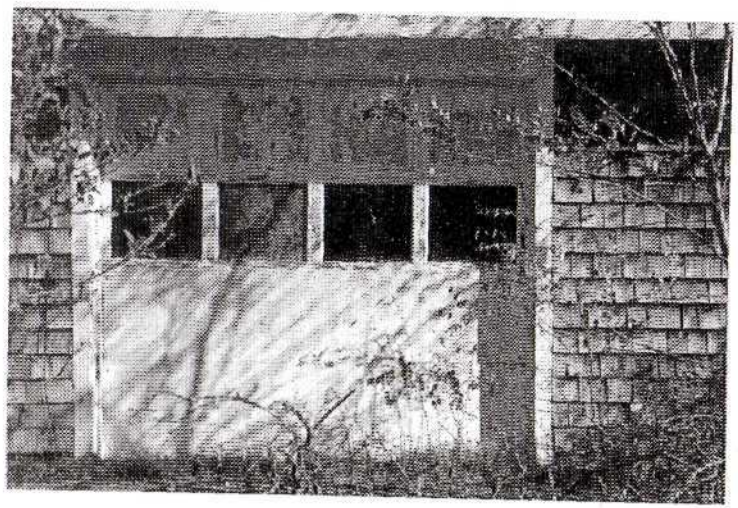


View from southwest.

History and Future Plans

Building #217 is one of 26 housing units originally used by the families of Air Force officers. Separated from the main base building complex, NPS anticipates houses with the potential for accessory workspace and universal accessibility.

Interior - bathroom.



Garage door.

Exterior Conditions

- *Roof*

  Asphalt shingle roof in **fair condition**. Leak in center over bathroom. Sheet metal chimney painted with brick trompe d'oiel in fair condition.

- *Wall*

  Exterior sheathed in white cedar shingles is in **fair/ poor condition**. Recommend replacement of 150 SF.

- *Trim*

  Painted wood trim in **poor condition**. Needs repair at both porticos (worse in rear) and window trims. Recommend replacement of 60 LF. Soffits in fair condition.

- *Foundation*

  Poured concrete slab on grade in **good condition**.

Framing

Gable Roof: Wood 2 x 6 rafters and C.J. @ 16" O.C. with plywood sheathing. **Good condition**.
Wall: Wood 2 x 4 with some insulation in **fair/good condition**. Offset bearing walls 3' apart form internal corridor; ceiling joists appear to run full-width across bearing walls and can be adjusted to accommodate remodeling for accessibility.
Floor: Concrete slab in **good condition**.

Life Safety

The two means of egress from Building #217 are in **fair/poor condition**. Advise that doors be replaced. One step up to main entrance; not handicap accessible. Narrow interior hallway (34").

Interior Conditions

- *Ceiling*

  Painted drywall in **fair/good condition**. Some mildew damage, minor cracks in drywall and peeling paint. Major leak in bathroom ceiling. Recommend repair and refinishing.

- *Wall*

  Painted drywall in **fair/good condition**. A lot of mildew and some holes. Recommend repair and refinishing. Ceramic tile in bathroom in good condition. Unfinished GWB in garage. Potential workspace at garage (and, possibly, adj. 3rd bedroom).

- *Trim*

  Painted slender metal door frames in **fair condition**. Painted wood window and door trim in **fair/good condition**. Tiny baseboards in **fair/good condition**. *Some mildew damage. Recommend replacing metal trim* and refinishing rest.

- *Floor*

  Sheet vinyl throughout in **fair/good condition**. Floor registers filled with cement. Bathroom tile floor in **good condition**.

Windows

Building #217 has 9 sliding vinyl windows in **fair/good condition**. Insulated glass is in poor condition. Recommend replacement of glazing.

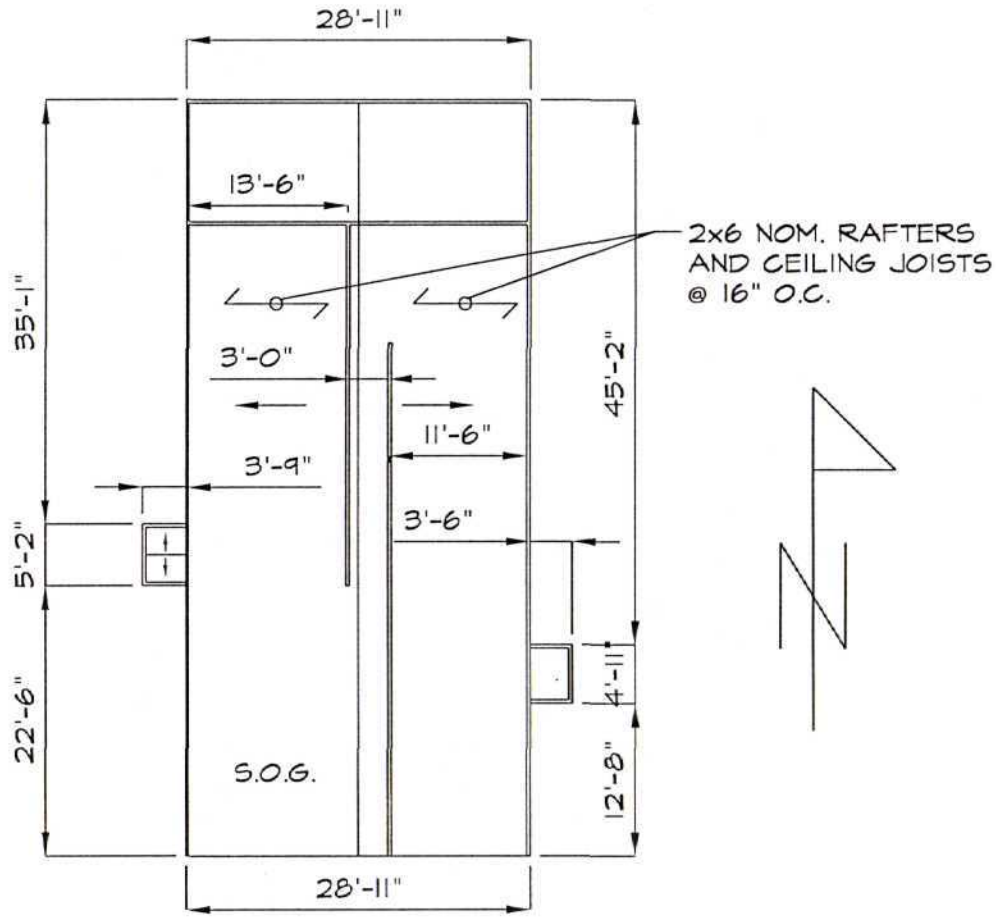
Doors

Interior doors include hollow core wood, raised panel, and vinyl bifold, all in **fair/poor condition**. All need to be refinished, but replacement is recommended. All interior doors are 2'-8". Two wood panel doors to exterior in **fair/poor condition**. Garage door in **poor condition**. Replacement of all doors recommended.

Reusable Fixtures

Bathroom sinks, tub and shower in fair condition and can be refurbished with new hardware, etc. Code requirements dictate replacement of WC; refer to Mechanical/Electrical/Plumbing section. Kitchen sink in fair condition. Laundry connections non-conforming. Counter space is small. Remove and replace all for fully accessible dwelling unit.

Building Number: 217



217

Building 217

A. Building Classification

Existing Family Housing is assumed to be R-4 residential use, a one- or two-family dwelling category including detached dwellings not more than three stories in height. Proposed R-4 use anticipates accessible single-family residential occupancy with potential accessory work space.

Per 310.6, R-4 structures shall be designed in accordance with residential State Code 780 CMR 36 or in accordance with the requirements of the Code applicable to Use Group R-3.

B. Occupancy and Fire Separations

Per 302.1.1, boiler and furnace rooms require 1-hour separation or an automatic fire suppression system.

C. Type of Construction

Type 5B, wood-framed building without fire resistant wall construction (i.e., not "protected construction" per 702.1).

D. Floor Area

1,815 sf < 4,800 sf max. for R-3.

E. Height and Number of Stories

1 story; conforms to 2-story/35' max. for R-3 (Table 503).

F. Occupancy

Proposed single-family residential use with potential work space treated as an *accessory* use. Note that per 313.3, in type 5B buildings with an R occupancy, the first floor shall not be occupied for use group B unless the floor/ceiling assembly and the enclosure walls are protected to afford a 1-hour fireresistance rating, and the exits from the residential floor are separately enclosed.

Maintenance of current R-4 use in 5B building would result in change in Hazard Index of +1; Chapter 34 provisions are applicable but subject to 3400.3 residential use restrictions.

Maximum floor area allowance for residential use is 200 gsf per occupant but actual maximum number of 6 is derived from number of bedrooms (3).

G. Exiting Requirements

Existing two-story Building #9 has two single-leaf exits. Per Table 1009.2, for R use, egress width of doors, ramps and corridors per occupant is .2" without sprinkler system, .15" with sprinkler system. Existing egress widths are adequate for 6 occupants.

Existing windows in Building 217 appear to meet the emergency escape window height requirement, which states that every sleeping room in R occupancy shall have at least one operable window (44" max. sill height; min. 5.7 sf opening, min. 24" high x 20" wide) or exterior door approved for emergency egress or rescue (1010.4).

H. Loading Requirements

Slab-on-grade floor. Refer to plan diagrams for structural information.

I. Accessibility

Main entrance is one step up; must be refurbished to make house fully accessible. Existing interior hallways are narrow (34" clear);bearing walls must be relocated. 2'-8" existing interior doors must be widened to 3'-0" (allowing 2'-8" clear passage). Kitchen and bathroom must be redesigned and fitted with accessible fixtures and appropriate accessories.

BUILDING #217: REQUIRED ARCHITECTURAL AND STRUCTURAL REPAIRS

1.	Repair/replace framing and sheathing	100	sf
2.	Remove and replace rotted trim	60	lf
3.	Remove and replace cedar shingles	150	sf
4.	Prepare and paint wood trim, soffits	1	job
5.	Remove and replace exterior doors, hardware	2	ea
6.	Remove garage doors; infill with walls/windows, complete	128	sf
7.	Reglaze vinyl windows	9	ea
8.	Repair and recondition window sills; paint	9	ea
9.	Remove and replace asphalt shingle roof	1	sq
10.	Install blown-in cellulose insulation at attic, R22	1,815	sf
11.	Install blown-in cellulose insulation at walls, cut & patch	1,750	sf
12.	General interior cleanout (gfa)	1,815	sf
13.	Renovate interior for accessibility: corridors, doors, kit., bath	1,525	sf
14.	Refurbish main entrance for universal accessibility (walkway)	1	job

IV MECHANICAL, ELECTRICAL, FIRE PROTECTION AND PLUMBING REPORTS – BUILDING NUMBER 217

A. HEATING, VENTILATING AND AIR CONDITIONING

1. Existing Conditions

a. Fan room adjacent to interior hall was provided with a forced hot air heating system, (oil as heating media), air-handling unit has been removed.
b. 6" x 4" outside air duct from roof to fan room provided outside air and combustion air to furnace requirements.
c. Air distribution system is provided by ducted air to floor supply grilles and transfer air from each room to hallway; return air is ducted to air-handling unit. All floor supply grilles have been removed and filled in with concrete.
d. Outside underground fuel oil tank has been removed. Fuel oil lines from removed tank remain and piped to air-handling room.
e. "NuTone" Electric wall exhaust fan provided for Kitchen ventilation.
f. 4" round dryer vent provided. Dryer removed.
g. Fan room provided with fire-matic alarms.
h. No toilet exhaust (window)
i. Electric cooking.
j. Electric Honeywell controls (inactive).

2. Recommendations

a. Due to existing forced air (under floor) ductwork has been filled with concrete and can not be reused. We recommend a forced hot water piping and fin-tube radiation system be provided.
b. A space must be provided for the installation of hot water boiler, pumps, piping. Possible space may be provided at a section of the unused garage. The existing furnace room is too small for the new boiler. New distribution piping will be installed above ceiling in the attic space and piped to new fin-tube radiation associated pumps, et cetera at the exterior walls. Separate heating controls will be provided for temperature control.
c. The hot water heating plant, provided with propane gas-fired boiler with propane tanks located outside.
d. New toilet exhaust fan.
e. Entry provided with wall converter.
f. Refer to plumbing for domestic hot water services.
g. Space automatic temperature control shall be electric/direct digital.
h. It is assumed that in potential work spaces, tenants shall provide any special exhaust systems and any special environmental temperature control conditions.

3. Miscellaneous

a. No central air conditioning is scheduled for this building, however window/wall type units may be considered.
b. Estimated building heating requirement is 150 MBH
c. Refer to supplement section: Sustainable Passive Solar and Wind Energy Technologies

B. PLUMBING

1. Existing Conditions (reviewed building 215 also)

a. Plumbing Fixtures
   1) Kitchen
      a) (1) Kitchen Sink – Stainless steel single bowl counter sink in fair condition. Faucet and disposer are in poor/failed condition and removed in some houses.
      b) (1) Laundry Connection – The location varies between houses. The water connection/faucet is in poor/failed condition. The waste standpipe is not properly installed to meet code. The 1½-inch standpipe is too tall for the trap location (at floor). The height of the standpipe may be insufficient in some homes.
   2) Bathroom 1
      a) (1) Tub – is in fair condition. Refer to architect's report for enclosure/door. The three handle

faucet/shower diverter does not comply with code. Lever waste drains were in poor condition.

b) (1) Lavatory – counter mounted on a cabinet is in fair condition. The faucet is in poor/failed condition due to age.

c) (1) Water closet – floor mounted, tank type does not meet code due to water consumption. Also due to the age, the tank components, water supply, et cetera are most likely in failed condition.

3) Bathroom 2

a) (1) Shower – stall is in fair condition. Refer to architect's report for enclosure/door. The shower valve may or may not operate properly. Leaks around drain at shower base were not confirmed.

b) (1) Lavatory – counter mounted on a cabinet in fair condition. The faucet is in poor/failed condition due to age.

c) (1) Water closet – floor mounted, tank type, does not meet code due to water consumption. Also due to age, the tank components, water supply, et cetera are most likely in failed condition.

4) Wall Hydrants – (2) exterior (front and rear) were in poor/failed condition. They were not freezeproof

b. Water Service

1) An existing ¾-inch service with shut-off rises from below the slab adjacent to the domestic water heater (in closet off main corridor). The service is assumed to run from the street to below the house slab.

c. Water Heating

1) Rheem model 81V52D 52-gallon electric (4,500 W, 1 phase, 240 V) storage water heaters. (1981)

2) The heater is located in a room off the corridor. The location may vary slightly between homes.

3) Regardless of age, the condition of these heaters is poor to failed. This is primarily due to the sedentary state of the heater since 1985.

4) The heater models and years vary between homes. Some heaters may be missing valves or safety devices.

d. Domestic Water Distribution

1) The domestic water is distributed to the kitchen and bathroom from below the floor slab.

2) The condition of the piping or the presence of lead solder at the fittings/joints needs further investigation.

3) The ¾-inch water service rises adjacent to the water heater. A ½-inch hot and cold water supply is distributed throughout the house.

e. Sanitary Distribution

1) All sanitary piping is buried below the slab. No cleanouts were found to verify the exact exit point.

2) The condition of the piping needs further investigation.

3) A single vent through roof is found on each house. Assume all vent piping within the house is run in the attic space.

f. Miscellaneous (beyond assumptions)

1) Review of houses 203, 202, 215 and 217 revealed similar layouts and plumbing system conditions. Slight variations exist such as missing fixtures, faucets or a more damaged/failed fixture.

2. **Recommendations** (Residence)

a. Plumbing Fixtures

1) Kitchen

a) Kitchen Sink – Install new faucet with hand spray, new basket strainer, tailpiece, trap and waste connection and new hot/cold water supplies with stops.

b) Washing Machine Connection – Install new recessed washing machine box with single lever ball valve hot/cold supplies and 1½-inch waste connection. Install new box at 48 inches above finished floor with 24 inch tall (1½-inch) standpipe and vent inside the wall. Install vacuum breakers on the hot/cold hose connections.

2) Bathroom 1
   a) Tub – Install new single handle shower valve (pressure balancing or thermostatic) within the shower with 3 handle to single handle conversion plate. Install new shower head with supply riser. Install new lever waste with overflow kit and drain strainer.
   b) Lavatory – Install new faucet with pop-up drain, new tailpiece, trap and waste connection and new hot/cold water supplies with stops.
   c) Water Closet – Install new 1.6 gallons per flush, floor mounted, tank type water closet with elongated bowl, wax ring, bolts/caps, seat with cover and water supply with stop.
3) Bathroom 2
   a) Shower – install new single handle shower valve (pressure balancing or thermostatic) within the shower stall. Install three handle to single handle conversion plate where necessary. Install new showerhead with supply riser. Install new drain strainer. Assume drain connection and base are free of leaks and cracks.
   b) Lavatory – Install new faucet with pop-up drain, new tailpiece, trap and waste connection and new hot/cold water supplies with stops.
   c) Water Closet – Install new 1.6 gallons per flush, floor mounted, tank type water closet with elongated bowl, wax ring, bolts/caps, seat with cover and water supply with stop.
4) General Building
   a) Install a new freezeproof wall hydrant with integral vacuum breaker and new inside shut-off at the front and rear of the house.
   b) For the proposed work space (assume in garage) the probable cost will include hot and cold water hose bibbs on the garage wall with integral vacuum breakers. Sanitary provisions or additional water requirements will be by the tenant during fit-up.

b. Water Service
   1) This report assumes that the existing ¾-inch water service from the street to the water heater room (below grade and slab) has successfully passes a hydrostatic pressure test, is free of lead and will remain in place.
c. Water Heating
   1) A new 50-gallon (40 BTUH input) direct vent propane fired water heater is recommended. The heater would be installed within the same room on the exterior wall at the rear of the house adjacent to the rear door.
d. Domestic Water Distribution
   1) This report assumes that the existing ½-inch hot/cold water distribution between the ¾-inch service/water heater and the fixtures has successfully passed a hydrostatic pressure test, is free of lead and will remain in place.
   2) Minimum branch piping modifications will need to take place at the new water heater, the new washing machine connection and at each fixture supply. These modifications will accommodate new fixture stops, new washing machine box and the relocation of the water heater to the exterior wall.
e. Sanitary Distribution
   1) This report assumes that the existing buried (below slab) sanitary piping as well as all waste and vent piping within partitions/attic has successfully passed a hydrostatic water test, is free of debris and will remain in place.
   2) At a minimum, it is recommended that a sampling of homes be inspected via a camera to review the internal integrity of the existing buried piping. This camera inspection will also aid in finding the exact location of all buried mains for future maintenance.
   3) Minimum branch piping modification will need to take place at the new washing machine connection and at each fixture waste connection. These modifications will accommodate new fixture waste connections at the wall and the work needed to install the new washing machine box.
f. Propane System
   1) This report assumes that a single point-of-use propane storage tank will be installed at each home. The bottle, pad and regulator will be provided by a propane supply

company. The estimate will include the propane piping distribution throughout the house from the regulator to the fixtures/equipment.

2) The new propane distribution will be in the attic space above the insulation. Branch piping will drop to fixtures within partition or exposed on the wall.
3) For estimating purposes, propane will supply the new heating system equipment and the water heater. In the attic, a capped valve will be left above the kitchen and laundry area to accommodate an optional gas fired stove/range and clothes dryer. Venting of all these devices needs to be coordinated between architect and mechanical sections.

g. Miscellaneous
1) The installation of Americans with Disabilities Act plumbing fixtures would need to be addressed separately from this report. Extensive renovations to the partitions, floor slab and plumbing systems would be necessary to accommodate the new fixtures.
2) If any of the water or sanitary systems (that are assumed adequate in this section) fail, then these systems would need to be addressed separately from this report. Extensive slab and/or partition cutting/patching would be necessary to accommodate the new piping.
3) No kitchen dishwasher is proposed. However, the tenant could renovate the plumbing below the kitchen sink to accommodate this addition. Cabinet modification for appliance would need to be addressed in the architectural section.
4) Based on review with a propane supplier, and tenant arrangements, it may be more economical and efficient to combine and connect several houses to one bulk propane storage tank (above or below grade). Meters could be proposed at each home connection for billing and usage, et cetera

C. FIRE PROTECTION

1. Recommendations

a. None required by code. A residential (NFPA 13R) automatic sprinkler system could be further investigated to help reduce Architectural/Building code requirements.

D. ELECTRICAL

1. Existing Conditions:

a. Building Electric Service:
1) 100 ampere, 120/240 volt, single phase, 3-wire overhead service drop from pole number 32 to a Square D, 100 ampere, type Q0 load center with main circuit breaker, 40 pole, 120/240 volt, single phase, 3-wire. Panel contains branch circuit breakers. Panel is in fair condition. Service has been disconnected.

b. Fire Alarm System:
1) Smoke Sentinel, single station smoke detector located in the corridor outside of the bedroom areas. The detector is not operational and is in poor condition.

c. Lighting:
1) Fixtures are a mixture of surface mounted type incandescent with lenses in various shapes, such as dish, square, globe, et cetera, which are in poor condition.

d. Emergency Lighting:
1) None.

e. Exterior Lighting:
1) Incandescent weatherproof type with gasketed white jelly jar 120 volts, switch controlled. Fixtures are located at the front and rear entries. Fixtures are in poor condition.

f. Wiring Devices:
1) Grounding type receptacles, color: brown (some white). Locations appear to be per Electric Code. Devices and coverplates are in fair to poor condition.
2) Washer and Dryer receptacles are damaged and in poor condition.

g. Telephone System:
   1) System has been disconnected. Interior wiring is in disrepair and in poor condition.
h. Cable Television:
   1) System has been disconnected. Interior wiring is in disrepair and in poor condition.

2. Recommendations:

a. All systems are in fair to poor condition and must be replaced for the building to be habitable for any use. See Part III. Typical Mechanical, Electrical, Fire Protection and Plumbing Items.
b. Refer to "Sustainability Supplement" section.

We have listed in Table 1 the location and estimated quantity, by square foot (sf), linear foot (lf), or other appropriate unit, of each type of ACBM identified at the site. We have also provided asbestos location drawings in Appendix B.

TABLE 1. • List Of Materials Testing Positive For Asbestos

Building 217, Truro Air Base, North Truro, Massachusetts

Type of Material	Location	Quantity
Tan linoleum floor sheeting	Kitchen, living room, hallway, Bedroom 1, Bedroom 2 and Bedroom 3	1,016 sf
Tan 9"x 9" floor tile and associated mastic adhesive	Kitchen, living room, hot water heater room, hallway, Bedroom 1, Bedroom 2 and Bedroom 3	1,150 sf
Joint compound and associated sheetrock	Walls and ceilings throughout including attached garage	3,950 sf

In Table 2, all materials that tested negative for asbestos are listed, including the locations where these materials were observed and the corresponding bulk sample reference number(s).

TABLE 2. • List Of Materials Testing Negative For Asbestos

Building 217, Truro Air Base, North Truro, Massachusetts

Type of material	Location(s) observed	Sample number(s)
Tan mastic adhesive associated with tan linoleum	Throughout, excluding hot water heater room and bathroom	217-04A
White gypsum wallboard (must be treated as ACM due to cross-contamination by associated joint compound)	Throughout	217-07A, 217-07B, 217-07C
Black tar paper	Underlying exterior wood siding shingled	217-09A

2.0 Conclusions and Recommendations

On the basis of our findings, we offer the following conclusions and recommendations:

1. Both friable and nonfriable ACBM were identified at the site. Should the building be renovated or demolished, removal of the ACBM will be necessary. Abatement of all friable as well as nonfriable ACBM that will be made friable by demolition activities must be performed before building demolition. This work should be conducted by a licensed Asbestos Abatement Contractor in accordance with a project design prepared by a certified Abatement Project Designer.
2. The sheetrock wallboard must be treated as ACM due to cross-contamination by the joint compound. All sheetrock and associated joint compound must be removed by a licensed asbestos abatement contractor.
3. If any suspect ACBM are identified at a later date that are not addressed in this inspection report, they should be assumed to be ACBM unless appropriate sampling and analysis demonstrates otherwise.
4. Develop a site-specific operations and maintenance (O&M) program for properly maintaining ACBM that will remain in place. Such a program would include a site-specific O&M plan, training of workers who may impact ACBM, periodic inspection of locations where ACM is present, and other applicable guidelines and procedures.

VHB XRF Field Testing Results

Site Access: Yes
Demo Permitted?: Yes
Project# 06780
Location: Building #217

Date 11/3/99
Page 1 of 2
Project Name: N. Truro AFS
Inspector: TMD

Location	Surface Tested	Substrate	Concentration (mg/cm^2)	Estimated Quantity*
Living Room	White window casing	Wood	< 0.1	
	White wall	SR	< 0.1	
	White baseboard	Wood	< 0.1	
	White door	Wood	< 0.1	
Kitchen	White wall	SR	0.3	
	White pantry	Wood	< 0.1	
	White upper cabinets	Wood	< 0.1	
	White lower cabinets	Wood	< 0.1	
	White ceiling	SR	< 0.1	
Hot Water Heater Room	White wall	SR	< 0.1	
	White door (to exterior)	**Wood**	**> 5.0**	**1**
Bathroom	White upper wall	SR	< 0.	
	White door	Wood	0.2	
Bedroom #1	White wall	SR	< 0.1	
	White window casing	Wood	< 0.1	
	White baseboard	Wood	< 0.1	
	White window casing	Wood	< 0.1	
	White door	Wood	< 0.1	
Bedroom #2	White wall	SR	< 0.1	
	White window casing	Plastic	< 0.1	
	White baseboard	Wood	< 0.1	
	White door	Wood	< 0.1	
Bedroom #3 (master)	White wall	SR	< 0.1	
	White window casing	Wood	< 0.1	
	White baseboard	Wood	< 0.1	
	White door	Wood	< 0.1	
Hallway	White wall	SR	< 0.1	
	White furnace closet door	SR	< 0.1	
Foyer	**White door (to exterior)**	**Wood**	**> 5.0**	**1**
	Yellow wall	Wood	< 0.1	
Garage	White overhead door	Wood	< 0.1	

*LBP components only. Limit of detection of NITON XRF is **< 0.1 mg/cm^2**) SR=Sheet Rock Block=Cinder Block

VHB

XRF Field Testing Results

Site Access: Yes
Demo Permitted?: Yes
Project# 06780
Location: Building #217

Date 11/3/99
Page 2 of 2
Project Name: N. Truro AFS
Inspector: TMD

Location	Surface Tested	Substrate	Concentration (mg/cm^2)	Estimated Quantity*
Front Vestibule	**White wall**	**Wood**	**> 5.0**	**150 SF**
	White trim	Wood	< 0.1	
Rear Vestibule	**White wall**	**Wood**	**> 5.0**	**150 SF**
Exterior	White window casing	Wood	< 0.1	
	White cornerboard	Wood	< 0.1	
	White upper trim	**Wood**	**> 5.0**	**200 SF**

*LBP components only. Limit of detection of NITON XRF is **< 0.1 mg/cm^2**) SR=Sheet Rock Block=Cinder Block SF=Square Feet